Spill Prevention, Preparedness, and Response Program

Washington State's Voluntary BAP Program for Tank Barges

Best Achievable Protection (BAP) Standards and Exceptional Compliance Program (ECOPRO) Standards

August 2000
WDOE Publication 00-08-021 (Rev. 4/01)

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Abstract: A compilation of 26 standards addressing operating procedures, personnel policies, management practices, and safety technology for companies participating in Washington State's Voluntary BAP Program for Tank Barges. Tank barge operators meeting these standards receive public recognition for their commitment to marine safety and environmental stewardship.

This publication is also available at our website at http://www.ecy.wa.gov/programs/spills/spills.html.

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Note: *Exceptional Compliance Program (ECOPRO) standards for tank barges were developed in collaboration with representatives from the tank barge and tow vessel industry.*

Companies participating in the ECOPRO program are required to meet the BAP standard ***AND*** *the corresponding ECOPRO standard.*

Washington State Department of Ecology
Spill Prevention, Preparedness, and Response Program

Washington State's Voluntary BAP Program for Tank Barges

Best Achievable Protection (BAP) Standards and Exceptional Compliance Program (ECOPRO) Standards

In addition to complying with applicable federal and international standards, the owner or operator of a tank barge operating in Washington State waters ensures the guidelines listed below are followed:

BAP Standard	ECOPRO Standard
1. Navigation Watch Composition Guidelines for tow vessel navigation watch composition: a. The navigation watch on the tow vessel consists of at least one licensed deck officer or tow vessel operator; b. When underway in restricted visibility, a lookout is assigned to the navigation watch and stationed in a safe location that allows sight and hearing of all navigational hazards and other vessels, and there is a rapid and reliable means of communication between the lookout and the tow vessel operator; c. The tow vessel's operator or officer in charge of the watch determines periods of restricted visibility and records in the deck log the date and time restricted visibility begins and ends; and d. The names of each navigation watch member are logged in the deck log at the time the member assumes duties.	**1. Navigation Watch Composition** The ECOPRO standard is identical to the BAP standard.

BAP Standard	ECOPRO Standard
2. Security Rounds Guidelines for security rounds: Security rounds are conducted in spaces designated by the vessel's operator to identify and to correct, if feasible, safety hazards such as potential fire hazards, defective machinery, hull and bulkhead integrity, malfunctioning safety equipment, potential sources of pollution, and potentially dangerous crew activities. a. Security rounds are conducted when the vessel is underway, anchored, and moored. b. Security rounds are done on as much of the vessel as the operator deems safe for the crew member making the round. The inspection includes, at a minimum: (1) Inspection of towing equipment; (2) Inspection of navigation lights on both the tow vessel and the tank barge, if the crew member can do so safely; and (3) For moored barges: (a) Inspection of the tank barge if attended by the tow vessel; or (b) Inspections that comply with 46 C.F.R. Sec. 35.05-15(b), if not attended by the tow vessel. c. Crew members making security rounds are provided appropriate training and checklists, and instructed to first notify the officer in charge of the watch before attempting corrective action, when a hazard is noted. d. Security rounds are made at least every two hours. On vessels with functioning automated fire and flooding detection systems, security rounds may be made at least every four hours. e. The officer in charge of the watch logs the completion of each security round in the deck log.	**2.** Security Rounds Security rounds are conducted at least every two (2) hours on all vessels, including those with functioning automated fire and flooding detection systems.

BAP Standard	ECOPRO Standard
3. Voyage Planning Guidelines for voyage planning: Berth to berth voyage plans are used and include, at a minimum, the following voyage planning practices and procedures: a. Channel depth and width, turning areas, navigational obstructions, and appropriate speed for each waterway transited based on current and up-to-date charts and navigational publications; b. Use of routes outside of charted traffic separation lanes or close to shore where not prohibited; c. Identification of commercial and recreational fishing grounds to be avoided or navigated; d. Identification of areas where tank barges may not transit including Deception Pass, Swinomish Slough, and Hadlock Cut in Puget Sound; e. Accuracy, dependability, and functioning of available navigational aids, including radio-navigational aids; f. Environmentally sensitive areas designated and provided by the Northwest Area Committee established under 33 U.S.C. sec. 1321(j), traffic separation systems, areas-to-be-avoided, landfalls, routes expected to be transited at night, and other areas where caution should be exercised; g. Predicted weather, currents, and tides; h. Expected vessel traffic; i. Review of the information in, and accuracy of, available charts, notices to mariners, and other navigational publications; and j. Tank barge inspections immediately prior to and after the voyage including inspections of hull integrity, towing equipment, and navigation lights.	**3. Voyage Planning** Regular voyage plan maintenance is done by a licensed tow vessel operator **AND** voyage plans are retained for at least six (6) months.

BAP Standard	ECOPRO Standard
4. Bar Crossing Procedures Guidelines for tows when crossing ocean bars: a. Tandem tows are prohibited; b. Crossings in heavy weather or sea conditions, or both, or when the swell height is excessive, are prohibited; c. All main deck hatches and ports on the tow vessel and barge are closed and secured; d. All generators and tow winch engines are running; e. Tow winch brakes are set with the air brake off and the hand brake set hand-tight; f. Chafe boards are left off; and g. The tow vessel operator pilots the vessel, a crew member is stationed at the tow winch controls with a rapid and reliable means of communication with the operator, and a crew member is on call to respond to machinery space alarms.	**4. Bar crossing procedures** The ECOPRO standard is identical to the BAP standard.
5. Navigation Equipment Checks Guidelines for tow vessel navigation equipment checks: a. The operator establishes a schedule for frequent comparisons of the steering gyrocompass with the magnetic compass; and b. Twelve hours or less before entering or getting underway, navigational equipment is checked including compasses, radars, and speed monitoring devices as applicable to the vessel. Compass errors are logged in the deck log.	**5. Navigation Equipment Checks** Magnetic compass is calibrated and a deviation table is prepared annually.

BAP Standard	ECOPRO Standard
6. Emergency Procedures Guidelines for emergency procedures: A tank barge (and a typical tow vessel used to transport the barge) operating in Washington State waters follows written policies, procedures, and practices for emergencies that apply to both the barge and the tow vessel. These written procedures are maintained on the tow vessel and available to the crew. These procedures address: a. Shipboard fires; b. Man overboard; c. Groundings and strandings; and d. Lost barge retrieval.	**6. Emergency Procedures** Additional procedures for at least the following types of emergencies are addressed in the tow vessel's written emergency procedures and/or station bills: • Loss of propulsion; • Loss of electrical power; • Loss of steering; • Compass malfunction; and • Flooding.
7. Event Reporting Guidelines for event reporting: If the vessel is involved in an event, as defined below, <u>while in state waters</u>: a. An event report is submitted to the Department of Ecology that describes: (1) The date time and location of each event; (2) The weather conditions at the time of the event; (3) The vessel operations underway at the time; (4) The identity of any facilities and other vessels involved in the event; (5) The type and amount of any oil spilled, and the estimated amount recovered; *Event Reporting continued on next page.*	**7. Event Reporting** The ECOPRO standard is identical to the BAP standard.

BAP Standard	ECOPRO Standard
7. Event Reporting, continued… (6) A list of any government agencies to which the event was reported; (7) A brief analysis of any known causes and contributing factors for each event that considers, at a minimum, human error, equipment or technology failure, and maintenance or inspection deficiencies; and (8) A description of measures taken to prevent a reoccurrence of each event, including changes to operating or maintenance procedures, personnel policies, vessel crew and organization, and the vessel's technology. b. The position plotting records, whether written, typed, recorded electronically or otherwise recorded, and the comprehensive written voyage plan, are not erased, discarded, or altered. c. "Event" means a: (1) Collision; (2) Allision; (3) Near-miss incident which means a pilot, master, or other person in charge of navigating a tank vessel successfully takes action of a non-routine nature to avoid a collision with another ship, structure, or aid to navigation, or grounding of the vessel, or damage to the environment; (4) Marine casualty which means those casualties described in 46 C.F.R. sec. 4.05-1, except subsections (a)(5), (a)(6) and (b), regardless of vessel type, nation of registry, or location; (5) Disabled vessel which means an accidental or intentional grounding, failure of the propulsion or primary steering systems, failure of a component or control system that reduces the vessel's maneuverability, or fire, flood, or other incident that affects the vessel's seaworthiness or fitness for service; or (6) Spills of oil from a tank vessel; or (7) For a barge, damaged towing gear.	**7. Event Reporting** The ECOPRO standard is identical to the BAP standard.

BAP Standard	ECOPRO Standard
8. Tank Barge Manning and Tow Vessel Crewing Guidelines for tank barge manning and tow vessel crewing: a. Two persons, one of whom must be a certified tankerman under 46 C.F.R. subpart 12.20, are on the tank barge while topping off the barge's cargo tanks, or one person, who is a certified tankerman, is on the tank barge during topping off if: (1) The tank barge is constructed to provide an unrestricted view of all cargo tank openings from any point on the barge and if topping off is conducted at a reduced rate of flow; or (2) The tank barge is equipped with overfill protection devices approved by the U.S. Coast Guard, and if topping off is conducted at a reduced rate of flow. b. At least one person is on the tank barge when receiving cargo but not topping off **AND** at least one person is on the tank barge when the tank barge is discharging cargo. c. Three licensed officers or tow vessel operators are on a tow vessel transporting a tank barge in coastal waters. d. Tow vessel operator (the company) maintains a list of crew member names.	**8. Tank Barge and Tow Vessel Crewing** 1. Two persons, **BOTH** of whom are certified tankermen, are on the tank barge while topping off the tank barge's cargo tanks **OR** one person, who is a certified tankerman, is on the tank barge during topping off if conditions a. (1) or (2) are met. **AND** **2.** When the tank barge is discharging cargo, the tank barge provides the receiving facility or vessel with a means of remotely shutting down the cargo pump(s) on the tank barge.
9. Comprehensive Training Program *The comprehensive training program includes familiarization (orientation) training, position-specific training, and refresher training. (see BAP Standards 10 – 12)* Guidelines for comprehensive training program: Within three years from the date of employment by the owner or operator, a crew member completes a company training program.	**9. Comprehensive Training Program** Training is completed within **ONE** year of hire.

BAP Standard	ECOPRO Standard
10. Familiarization (orientation) Training Guidelines for familiarization (orientation) training: Before being assigned to duties, tow vessel crew members receive familiarization training in personal survival techniques including: a. Communicating with other persons on board about elementary safety matters and understanding safety information symbols, signs, and alarm signals; b. What to do if: (1) a person falls overboard, (2) fire or smoke is detected, or (3) the fire or abandon ship alarm is sounded; c. Identification of muster and embarkation stations and emergency escape routes; d. Location and donning of life-jackets; e. Raising the alarm and basic knowledge of the use of portable fire extinguishers; f. Taking immediate action upon encountering an accident or other medical emergency before seeking further medical assistance on board; and g. Closing and opening the weathertight and watertight doors, and firetight doors (if fitted).	**10. Familiarization (orientation) Training** A formal orientation checklist is used for all personnel at time of sign-on **AND** familiarization (orientation) training includes additional topics. Some examples of additional topics are: • Office-based orientation in the working relationship between shore-based vessel operations and tank barge/tow vessel operations (for licensed tow vessel operators and certified tankermen). • Self-contained breathing apparatus (for example, MSA or Scott Airpak) training, including fit testing (for tank barge personnel). • Orientation and training in looking for, and reporting, oil in the water around the tank barge and tow vessel (for all crew members). • Contingency plan orientation. • Field document orientation, including notification drill orientation.

BAP Standard	ECOPRO Standard
11. Position-Specific Training Guidelines for position-specific training: The tow vessel crew and tank barge personnel are trained in: a. Oil spill prevention and response responsibilities; and b. Shipboard fire fighting. c. Tank barge personnel are also trained in cargo handling.	**11. Position-Specific Training** Position-specific training is provided more frequently than every five years **OR** training in additional topics is provided. Examples of additional topics are: • Inert gas systems, if tank barges are so equipped. • Advanced marine fire fighting. *See Table A-VI/3 in Section A-VI/3 of the STCW 95 Code.* • Bridge Resource Management. • Tow vessel handling.
12. Refresher Training Guidelines for refresher training: Crew members receive refresher training at least once every five years. Personnel who fail to undergo refresher training within five years, repeat the position-specific training program. Refresher training includes examination of the crew member's skills to determine his or her ability to safely and effectively perform in the position assigned.	**12. Refresher Training** Any training identified as necessary to improve performance is accomplished within one year of being identified.
13. Emergency Drills Guidelines for emergency drills: Tow vessel crews conduct the following drills: a. For coastal towing: (1) Fire fighting and man overboard drill monthly; (2) Review of lost barge retrieval procedures and oil spill response procedures at least once per voyage. *Emergency Drills continued on next page.*	**13. Emergency Drills** A formal critique of the drill is presented to all crew members after each drill **AND** items requiring follow-up corrective action are logged **AND** a crew member is assigned to take the required corrective action.

BAP Standard	ECOPRO Standard
13. Emergency Drills, continued… b. For inland waterway towing: (1) Fire fighting drill monthly; (2) Lost barge retrieval drill monthly; and (3) Man overboard and oil spill response drills quarterly.	**13. Emergency Drills** A formal critique of the drill is presented to all crew members after each drill **AND** items requiring follow-up corrective action are logged **AND** a crew member is assigned to take the required corrective action.
14. Drug and Alcohol Policies Guidelines for drug and alcohol policies: All personnel on tank barges (and a typical tow vessel used to transport the barge) operating in Washington State waters comply with 33 CFR Part 95 and 46 CFR Parts 4 and 16, except 46 CFR sec. 16.500. The owner's or operator's policies, procedures, and practices also ensure that: a. A person neither consumes, nor is under the influence of, alcohol on a tank barge or tow vessel while in state waters unless that person is a passenger who does not perform, and will not perform, any duty on the tow vessel or tank barge in Washington State waters; and b. A person neither consumes, nor is under the influence of, illicit drugs on a tanker while in Washington State waters.	**14. Drug and Alcohol Policies** Vessel personnel are trained in both drug and alcohol abuse awareness and in drug and alcohol testing (for post accident and probable cause) **OR** random testing is conducted more frequently.
15. Work Hours (Rest Periods) Guidelines for work hours (rest periods): Crew members comply with OPA 90 work hour restrictions or STCW 95 rest period requirements. Company policies ensure crew members are well-rested and able to perform their duties. Work hours (rest periods) are documented and maintained, and if requested, made available to the Department of Ecology.	**15. Work Hours (Rest Periods)** Work hour restrictions exceed OPA 90 requirements or rest periods exceed STCW 95 requirements **OR** additional qualified tank barge personnel are available if needed to meet work hour (rest period) requirements.

BAP Standard	ECOPRO Standard
16. Record Keeping – Training Records and Work Hour Records Guidelines for Record Keeping – Training Records and Work Hour Records: a. *Training Records.* Detailed training records are maintained for all crew on each vessel. The records include the training required to obtain a license or merchant marine document, completion dates, and performance evaluations of the training described in the training section. Personnel training records are maintained either on the vessel where the person is assigned or at a central location. If the owner or operator maintains personnel training records, the owner or operator will provide the Department of Ecology any requested records within seventy-two hours of receiving a request for the record. b. *Work Hour Records.* Compliance with applicable federal work hour requirements is documented on board the vessel and, if requested, provided to the Department of Ecology.	**16. Record Keeping - Training Records and Work Hour Records** The ECOPRO standard is identical to the BAP standard.
17. Vessel Visitation Guidelines for vessel visitation: Quarterly visits are conducted by company management, such as port captains or port engineers, to review shipboard management and operations with the vessel master and chief engineer, and provide guidance in correcting identified problem areas. The time, date, and findings are recorded in the deck log.	**17. Vessel Visitation** Vessel is visited more frequently than quarterly **AND** shore-based company personnel manage vessel visitation program and follow-up tracking system.
18. Planned Maintenance Program Guidelines for planned maintenance program: A planned maintenance program for a tow vessel's navigation, propulsion, steering, communications, electrical, and tank barge's cargo handling systems that involves at a minimum: a. Preventive maintenance for each system according to the procedures and recommended frequency of the machine's or equipment's manufacturer; *Planned Maintenance Program continued on next page.*	**18. Planned Maintenance Program** Selected systems are inspected more frequently than annually if appropriate.

BAP Standard	ECOPRO Standard
18. Planned Maintenance Program, continued… b. Annual inspections of each system; and c. Inventory control and maintenance of necessary replacement parts.	**18. Planned Maintenance Program, continued…** Selected systems are inspected more frequently than annually if appropriate.
19. Hull Inspection Plans Guidelines for inspection of tank barge holds (tanks), piping, and hull: Critical areas of a vessel's holds (tanks), piping, and hull are visually inspected annually and thickness is gauged where structural integrity is questioned. Any deficiencies are corrected. Corrosion is noted, reduction measures are identified, and corrosion reduction measures are scheduled.	**19. Hull Inspection Plans** Critical areas are inspected more frequently than annually if it is indicated by historical information and/or predictive models.
20. Preventive Maintenance Documentation Guidelines for tank barge preventive maintenance documentation: Surveys of the holds (tanks), piping, and hull by the vessel's classification society, and annual inspections or surveys by any other independent entity are documented, and any reports generated are retained on board.	**20. Preventive Maintenance Documentation** Explicit documentation and maintenance instructions are posted or readily available.
21. Technology – Navigation Equipment Guidelines for navigation equipment: Tow vessels transporting tank barges are equipped with: a. A functional radar; and b. In coastal waters, are equipped with a global positioning system (GPS) receiver.	**21. Technology – Navigation Equipment** Tow vessels have two (2) functioning radars **AND** two (2) VHF radios **AND** GPS.

BAP Standard	ECOPRO Standard
22. Technology – Towing Equipment Guidelines for towing equipment: a. *Coastal Tow Wire.* The tow wire for coastal hawser towing has: (1) A diameter of at least one and one-quarter inches; (2) A nominal breaking strength of two one-half times the bollard pull of the tow vessel; (3) An independent wire rope core; (4) Improved plow steel or extra improved plow steel wire; (5) Been heavily lubricated or galvanized at the time of manufacture; (6) A right or left regular lay and is six-by-nineteen construction or larger; and (7) A tow line that terminates in either: (a) A spelter or thermo-set resin poured socket sized to exceed the breaking strength of the tow wire; or (b) A spliced eye with a thimble sized to exceed the breaking strength of the tow wire. b. *Inland tow wire*. The tow wire for inland hawser towing meets with the requirements in (a) of this section except: (1) The primary tow line for inland towing may be synthetic fiber; and (2) Swaged eyes and wire clips are not used on the primary tow line. *Technology – Towing Equipment, continued on next page.*	**22. Technology – Towing Equipment** Tow line components exceed BAP standards for size **AND/OR** breaking strength **AND** tow vessel is able to abort and reset the tow winch brake from each steering station on the tow vessel **AND** the above system is tested monthly **AND** the monthly test is documented in the log book.

BAP Standard	ECOPRO Standard
22. Technology – Towing Equipment, continued... c. *Bridles and Surge Chains***.** Tank barges are equipped with: (1) For coastal hawser towing, a tow bridle and surge chains where the: (a) Breaking strength of each bridle leg and the surge chain is 1.3 times the nominal breaking strength of the primary tow line; (b) Chain used is Grade Two or higher, welded or forged, integral stud link chain; and (c) Surge chain may have an end link or one studless link; (2) For inland hawser towing, tow bridles made of chain or synthetic fiber or wire-rope where the breaking strength of each bridle leg is equal or greater than the nominal breaking strength of the primary tow line. d. *Barge Fittings***.** Tank barges are equipped with: (1) Two tow pads to which the tow bridle is connected where the: (a) Tow pad and supporting structure have a yield strength of 1.25 times the nominal breaking strength of the tow line; (b) Tow pad can carry the load applied throughout the full arc possible in normal service; and (c) The axis of the tow pads lies along the axis of the attached bridle leg when towing straight ahead; and *Technology – Towing Equipment, continued on next page.*	**22. Technology – Towing Equipment** Tow line components exceed BAP standards for size **AND/OR** breaking strength **AND** tow vessel is able to abort and reset the tow winch brake from each steering station on the tow vessel **AND** the above system is tested monthly **AND** the monthly test is documented in the log book.

BAP Standard	ECOPRO Standard
22. Technology – Towing Equipment, continued... (2) Towing fairleads, if the tow pads are not located at the extreme bow, and where: (a) Closed fairleads or chocks are installed so that each leg of the tow bridle leads straight from the bridle apex through the center of the fairlead to the tow pad; (b) The fairlead opening is round or oval, and large enough to pass all parts of the bridle in either direction but without allowing excessive lateral motion; (c) All fairlead surfaces are ground smooth with a radius four times greater than the bar diameter of the chain, or the diameter of the synthetic or wire-rope used. e. *Shackles***.** All shackles used are: (1) Rated with a breaking strength of 1.3 times the nominal breaking strength of the primary tow line; (2) Either round pin anchor shackles or chain safety shackles with a locking nut secured by a nut and bolt, or cotter pin; (3) Forged or cast; and (4) Marked with the shackle's safe working load and the shackle's rated or minimum breaking strength. f. *Shackle and Flounder Plates***.** Shackle and flounder plates are: (1) Constructed of whole plates with no welding other than on assembly gussets and reinforcing rings; and (2) Triangular cast, forged, or fabricated steel equal to the ASTM-36 standard with all corners rounded. *Technology – Towing Equipment, continued on next page.*	**22. Technology – Towing Equipment** Tow line components exceed BAP standards for size **AND/OR** breaking strength **AND** tow vessel is able to abort and reset the tow winch brake from each steering station on the tow vessel **AND** the above system is tested monthly **AND** the monthly test is documented in the log book.

BAP Standard	ECOPRO Standard
22. Technology – Towing Equipment, continued... g. *Wire Rope Records, Inspections and Maintenance***.** All wire rope towing equipment described in (a) through (c) of BAP Standard 22 are inspected and maintained in accordance with the standards in U.S. Coast Guard Navigation and Vessel Inspection Circular (NVIC) 5-92, enclosure 1, part B. h. *Chafing Protection***.** All towing equipment described in (a) through (d) of this section are protected from chafing where the component contacts a surface that could cause wear during normal operation. i. *Tow Winches***.** Tank barge tow winches : (1) Accept and hold a load equal to the breaking strength of the tow line without damage to the winch, its foundation, or brakes; (2) Have a brake on the main cable drum capable of holding the breaking strength of the innermost layer of the tow line without power to the winch; (3) Have a towing winch cable drum with a minimum diameter 12 times the diameter of the tow line; (4) Have a connection between the tow line bitter end and the winch cable drum with a holding capacity no greater than fifteen (15) percent of the breaking strength of the tow line; (5) Always have ten or more wraps of the tow line on the bottom layer of the cable drum while towing; and (6) Have control stations located where emergency release of the tow line does not endanger operating personnel.	**22. Technology – Towing Equipment** Tow line components exceed BAP standards for size **AND/OR** breaking strength **AND** tow vessel is able to abort and reset the tow winch brake from each steering station on the tow vessel **AND** the above system is tested monthly **AND** the monthly test is documented in the log book.

BAP Standard	ECOPRO Standard
23. Technology – Emergency Reconnection Equipment Guidelines for emergency reconnection equipment: A tank barge has emergency reconnection equipment for coastal hawser towing (towing astern) as follows: *Emergency Tow Line***.** An emergency tow line and components where the: a. Breaking strength of the tow line and components is 1.5 times the bollard pull of the tow vessel; b. Tow line's bitter end is secured down the barge deck from bow to stern with break-away clips; and c. Towing end of the tow line is attached to a trailing buoy with a five-inch polypropylene floating line. *Hook retrieval device***.** The hook retrieval device is slotted to lock into, and pick up, the tow bridle of the barge adrift. The purpose of the hook retrieval device is to reconnect the tow vessel's tow line to the towing bridle of the barge adrift.	**23. Technology – Emergency Reconnection Equipment** Tow line and components exceed minimum strength requirements specified under the BAP standard.
24. Technology – Fenders Guidelines for fenders: Tow vessels used to transport tank barges are equipped with a fender system capable of absorbing the impact of the tow vessel coming alongside the tank barge, and able to protect all parts of the tow vessel's bow and stern exposed to contact during normal operations.	**24. Technology – Fenders** The ECOPRO standard is identical to the BAP standard.

BAP Standard	ECOPRO Standard
25. Technology – Navigation Lights and Day Shapes Guidelines for Navigation Lights and Day Shapes: Tank barges and tank barge tow vessels are equipped with navigation lights and day shapes required by the U.S. Coast Guard. Tank barge electrical systems meet American Bureau of Shipping and U.S. Coast Guard standards for the most volatile cargo allowed on the barge according to the barge's certificate of inspection or other classification document.	**25. Technology – Navigation Lights and Day Shapes** A redundant navigation light system is fitted, for example automatic lamp changers **OR** a written procedure, posted in tow vessel pilot house, specifies action to take in the event of loss of lights on barge. For example, an alternative to automatic lamp changers is illuminating the barge with tow vessel flood lights when vessel traffic is encountered.
26. Technology: Tug–Tow Match Guidelines for Tug–Tow Match: Tow vessels that transport tank barges in Washington's coastal waters have: a. Twin screws; and b. Minimum bollard pull of four pounds per deadweight ton of the tank barge.	**26. Technology: Tug–Tow Match** **ALL** tow vessels, regardless of operating area, have: Twin screws **AND** bollard pull greater than 4 lbs. per deadweight ton of the tank barge.